



Effect of Peer Education on the Resilience of Mothers of Children with Leukemia: A Clinical Trial

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Abstract

Background: Resilience has become a basic construct in theories and studies of welfare and mental health. The mother is the one most involved emotionally in the child's cancer and its treatment and hence, she requires the most degree of resilience. Therefore, it is crucial to deploy effective methods to enhance the resilience of mothers.

Objectives: The purpose of this study was to determine the impact of peer education on the resilience of mothers of children with leukemia.

Methods: This clinical trial was performed on 74 mothers of children with leukemia who had been hospitalized in the hematology ward of Ali ibn Abi Talib Hospital in Zahedan in 2017. Convenience sampling was used to recruit the participants in accordance with the inclusion criteria. The subjects were randomly assigned to the control and experimental groups. Peer group training was then conducted for the experimental group for five days. The Connor-Davidson Resilience Scale (CD-RISC) was completed for both groups before and immediately after the intervention, as well as two months later. The data were then analyzed using the chi-square test (Fisher's exact test), independent *t*-test, repeated measures ANOVA, and Bonferroni post hoc test at the significance level of $P < 0.05$.

Results: The results showed that the mean total score of resilience and its subscales did not make a significant difference between the control and experimental groups immediately after the intervention ($P > 0.05$). Meanwhile, two months post-intervention, a significant difference was observed in this regard between the control and experimental groups, with the latter featuring a higher mean score ($P < 0.001$). Besides, the results suggested a significant increase in the total score of resilience and all its subscales over time in the experimental group ($P < 0.001$).

Conclusions: Peer education could be implemented as an inexpensive easy method to improve the resilience of mothers of children with leukemia.

Keywords: Peer Education, Resilience, Children, Mothers, Leukemia

1. Background

Cancer is one of the leading causes of morbidity and mortality worldwide in the general population, including children (1,2). In childhood, cancer includes a set of benign and malignant tumors caused by disorders in the process of cellular development (3). The term 'childhood cancer' refers to cancer cases diagnosed in people under the age of 15 years (4).

Among all types of cancer, leukemia is the most common childhood cancer in the world (5). Approximately, 160,000 new cases of cancer and 90,000 child deaths occur every year globally (2). In Iran, evidence suggests that it accounts for the death of about 4% of children under the

age of five and 13% of children aged 5 to 15 years. According to the Iranian Pediatric Hematology and Oncology Society (IPHOS), 80% of children with cancer are fully recovered, and their certain recovery could reach 95% if they would receive timely treatment (6).

Following the diagnosis of cancer in children, many psychological, social, and financial problems overwhelm the parents (7). Research has shown that having a child with cancer can disturb the emotional state of parents and interfere with their marital relationship, leading to changes in parental roles and creating tension among the members of the family (8). In this situation, different levels of anxiety, shock, depression, disappointment, and denial affect the parents, especially in the early stages of cancer

diagnosis (9). However, many studies have highlighted the consequential role of parents in caring for children and increasing their possibility of survival (10). Because children spend a considerable part of their treatment at home, multiple new responsibilities are imposed on the parents in addition to their usual duties; these include controlling drug consumption, poisoning, side effects, and communication with the treatment team (11). Therefore, promoting adaptive skills and improving mothers' resilience are essential in the diagnosis, treatment, and follow-up procedures.

Resilience is among the topics discussed in positive psychology that refers to the human ability to adapt to illnesses, suffering, and pain in the course of life (12). It seeks to ensure that a person can maintain her social performance and overcome new challenges despite the risk of exposure to severe stress and risk factors (13). Connor and Davidson (2003) describe resilience as the one's capability to keep a bio-psychological balance in difficult conditions and take an active role in a situation (14). Today, resilience is an integral part of theories and studies on welfare and mental health (15). Growing research demonstrates that boosting this quality is associated with improving the mental health and well-being of individuals (16).

In the process of a child's cancer diagnosis, treatment, and follow-up care, mothers are engrossed more than anyone else into emotional experiences and gradually develop psychological symptoms such as anxiety (17). Consequently, they need the highest degree of resilience and it is imperative to adopt various methods to enhance their resilience.

Studies have shown that women tend to talk with people of similar experiences who have been able to overcome their illness crisis (18). Meeting like-minded people is a relief and reassurance for the individual and can make her learn adaptive methods to overcome the difficulties (19). It seems that peer education has the potential to raise resilience in mothers of children with cancer.

This type of education originates in Bandura's social learning theory. Based on this theory, individuals learn from each other through observation, imitation, and modeling (20). Peer education is a process in which the trained person takes responsibility for the organized education of people with similar circumstances. The purpose of this training is to raise awareness and improve the skills of individuals in the group and enable them to assume the responsibility for safeguarding their own health and that of other people around them (21). Undoubtedly, people who experience a disease or a difficult situation can better help others with similar conditions (22).

In this educational approach, given the similar characteristics of the group members, each person is able to share her weaknesses, strengths, and experiences with her peers

at the lowest cost (23). Dehghani et al. studied and confirmed the effect of peer education on reducing stress in patients with multiple sclerosis (24). Exploring different databases, the authors found no research that would have used peer education in order to improve the resilience of mothers of children with leukemia.

2. Objectives

This study aimed at determining the effect of peer education on the resilience of mothers of children with leukemia who had been admitted to a health facility in Southeast Iran in 2017.

3. Methods

This two-group clinical trial was approved by the Ethics Committee of Zahedan University of Medical Sciences under the code Ir.zaums.REC.1396.115. It was carried out on all mothers of children with leukemia who had referred to the Hematology Ward of Ali ibn Abi Talib Hospital in Zahedan in 2017.

Since there was no similar study in this area in Iran, the sample size was estimated at 80 (40 for each group) by using G*Power software and considering the Cohen's effect size of 0.5 ($\alpha = 0.05$ and $\beta = 0.8$) and a 15% attrition rate.

Convenience sampling was employed to select the mothers of children with leukemia according to the inclusion criteria. The criteria for entering the study were as follows: (1) willingness and informed consent to participate in the study, (2) being the primary caregiver of the child, (3) making a diagnosis at least for three months confirmed by a specialist, (4) no history of participation in educational programs on resilience or similar concepts, and (5) mother's mental and physical health to the extent that the research procedures are not restricted. On the other hand, the exclusion criteria included the reluctance to continue the intervention or the occurrence of any incident such as death, migration, and discontinuation of the treatment of the child such that it might cause the mother to be absent from more than two training sessions.

Among the mothers meeting the inclusion criteria, those who completed the informed consent form entered the study. Subsequently, participants completed a demographic form and the Connor-Davidson Resilience Scale (CD-RISC). The subjects were then randomly assigned to the control and experimental groups using permuted (quadruple) blocks with the help of Random Allocation software.

In the first stage of the intervention, the peer educator was selected and educated. One mother who was the

primary caregiver during treatment and had the following characteristics was chosen as the peer educator: (1) willingness and informed consent to take part in the intervention; (2) a minimum education of high school diploma; (3) the ability to train and communicate with others; (4) being a local person with fluency in Persian; (5) living in Zahedan; and (6) having successful experiences of the treatment process of the child. Eventually, a mother with a bachelor's degree whose child had successfully reached the final phase of chemotherapy (i.e., maintenance) was chosen.

To prepare the peer educator, three instructional sessions, each lasting one hour (25), were held in which brainstorming and question-and-answer methods were deployed. In these sessions, the need for organizing such an intervention, its stages, the method of implementation, and the training program were fully explained. The purpose of the sessions was to review experiences and information, modify them based on accepted scientific principles, and ultimately prepare the mother-instructor for peer education. The task of the peer educator who led the peer group was to manage the meetings by guiding the mothers toward the desired subject, presenting her own individual experiences, encouraging mothers to participate in discussions, and finally summing up previously raised topics (26). The ability of the peer educator to learn accurate information was evaluated through question and answer and role play (27).

In the second stage of the intervention, the experimental group was divided into subgroups of 10 people. The peer educator was then asked to discuss the materials and direct the group in a friendly and favorable environment based on previous instructions. The researchers were in charge of providing the content, scheduling, and monitoring the sessions.

No intervention was performed for the control group, and these individuals received conventional care and training. It should be noted that in order to prevent the control group from having contact with the experimental group and thus, reduce the possibility of information exchange, the control group was first selected and their related data were collected. In fact, the intervention started upon the discharge of the children of mothers in the control group.

The materials of the peer education program, based on the study of Hosseini Ghomi and Salimi Bajestani and the approval of a psychiatric nurse consultant, were taught to each subgroup in five sessions (13). Each session began by clarifying its goals. Then, the peer educator undertook the task of teaching and sharing her information, experiences, and social backgrounds. At the end of each session, the peer educator summarized the materials discussed and answered the questions. At the end of the train-

ing program, an educational pamphlet was provided to the mothers. The content of the training sessions is recapitulated in Table 1. Based on previous studies in this field (28), each subgroup was exposed to one session a day for five days, each session lasting 1.5 hours. The sessions were held in the training room of the hematology ward of Ali ibn Abi Talib Hospital when the children of the experimental group were still hospitalized. Immediately after the intervention and two months later, CD-RISC was completed for both experimental and control groups again.

Data collection tools consisted of the CD-RISC (2003) and a demographic questionnaire covering mother's age, child's age, child's gender, duration of leukemia, mother's occupation, residence, mother's marital status, and mother's education. Aiming to measure the level of resilience in different populations, CD-RISC has 25 items that are scored based on a 5-point Likert scale (from rarely true = 0 to true nearly all of the time = 4). The tool has five subscales: the concept of personal competence (eight items), trust in one's instincts and tolerance of negative affect (seven items), positive acceptance of change and secure relationships (five items), control (three items), and spiritual influences (two items). The score of each subscale was obtained by summing up the score of its items and the total score of resilience was the sum of the score of all items, ranging from 0 to 100 (14). The validity of this tool was confirmed in Iran by Mohammadi, with Cronbach's alpha being 89.0 for the total scale (29). In the present study, Cronbach's alpha of CD-RISC was 78.0.

The data were analyzed by SPSS version 16 using descriptive and inferential statistics at the significance level of $P < 0.05$. Descriptive statistics (including frequency, mean, and standard deviation) were used to describe the demographic characteristics, as well as the main variables of the study. Then, the Kolmogorov-Smirnov test was employed to determine the data distribution. Other tests used included the chi-square (Fischer's exact test), independent *t*-test, repeated measures ANOVA, and Bonferroni post hoc test.

4. Results

The study was ultimately conducted on 74 mothers, 36 of whom were in the experimental group and 38 in the control group. In fact, in the experimental group, two mothers declined to continue cooperation due to moving their sick children to more equipped hospitals in another city. Four other participants were also excluded due to being absent from more than two educational sessions. Similarly, in the control group, two people were excluded since they did not take part in more than two sessions. The mean age of the mothers was 33.94 ± 8.49 in the experimental group and

Table 1. The Content of the Peer Education Program

Session	Details
Session 1	The researcher and participants getting acquainted with each other; explaining the study objectives and the manner in which the intervention was to be implemented to gain the confidence of the participants; explaining the role of the researcher, the group leader, and other participants; introducing the general framework of the topics; defining resilience and the characteristics of resilient people such as happiness, wisdom and insight, humor, empathy, rational adequacy, purposefulness in life, and stability; providing solutions and experiences about the challenges and difficulties posed by the child's illness; elaborating on problem-solving solutions and increasing personal adaptation; encouraging mothers to share their experiences
Session 2	Teaching and sharing experiences of the use of internal protective factors (optimism and self-esteem) and external protective factors (family, friends, other people, and social support systems)
Session 3	Training different ways of cultivating resilience and expressing one's experiences, communicating with others, accepting new conditions, hoping for the future, and employing various strategies to reduce stress
Session 4	Continuing to discuss resilience strategies: promoting self-awareness, self-confidence, and self-care
Session 5	Summing up, conclusion, and performing the post-test

35.29 ± 6.97 in the control group. The mean age of children was 6.89 ± 3.47 in the experimental group and 7.26 ± 3.52 in the control group. Moreover, the mean duration of children's disease was 12.53 ± 1.92 months in the experimental group and 13.58 ± 1.62 months in the control group. The frequency distribution of other demographic variables is presented in Table 2.

Based on the results of Table 2, the distribution of demographic variables in the experimental and control groups was homogeneous and did not show any significant between-group difference ($P < 0.05$).

The results of the Kolmogorov-Smirnov test showed that before the intervention, immediately after the intervention, and two months later, the variables of resilience and its dimensions had normal distributions in the experimental and control groups ($P < 0.05$).

Before the intervention, no significant difference was observed between the two groups in terms of the mean total scores of resilience and the subscales of personal competence, trust in one's instincts and tolerance of negative affect, and spiritual influences ($P > 0.05$). However, the mean scores of the two subscales of control and positive acceptance of change and secure relationships were significantly different between the two groups before the intervention ($P < 0.05$) (Table 3).

On the other hand, the mean total scores of resilience and its subscales did not make a significant difference between the two groups immediately after the intervention ($P > 0.05$). However, two months after the intervention, a significant difference emerged in the mean total scores of resilience and all its subscales between the two groups, with the experimental group displaying higher scores ($P < 0.001$).

The results of intragroup repeated measures ANOVA demonstrated that the mean total scores of resilience and all its subscales improved significantly over time in the experimental group ($P < 0.001$) (Table 3).

Investigating the above result through Bonferroni test showed that this significant difference was related to the mean scores (a) before the intervention and two months post-intervention and (b) immediately after the intervention and two months post-intervention ($P < 0.05$).

5. Discussion

The aim of this study was to determine the effectiveness of peer education on the resilience of mothers of children with leukemia admitted to the Hematology Ward of Ali ibn Abi Talib Hospital, Zahedan, Iran. The results proposed that such training helps enhance resilience and its components over time in this population. The results of the studies mentioned below are noteworthy in the support of this finding.

Sadler et al. explored the improvement of resilience in stroke patients using a novel peer support program that was implemented through qualitative interviews and peers support sessions. They reported a significant rise in the resilience score of these patients after the intervention (30). Robinson et al. performed a qualitative-interventional study on 21 unemployed men by organizing peer support sessions and then conducting structured interviews. The results suggested a significant improvement in the perceived score of the resilience of the subjects (31). Although the interventions executed in the above studies structurally differ from the one used here, the results of all the three studies corroborate that the implementation of interventions with the help of a peer educator could bring about a significant difference in the score of resilience. Thanks to their psychosocial outcomes, Sadler et al. believe that such interventions can improve the resilience of individuals, especially those with chronic conditions (30).

Similarly, Walsh observed that in order to boost resilience, one must consider the beliefs that each person sticks to in the family and community. Inasmuch as no one

Table 2. Frequency Distribution of Demographic Variables in the Study Groups^a

Variable	Group		P Value
	Intervention (N = 36)	Control (N = 38)	
Child's gender			0.50 ^b
Female	15 (41.67)	13 (34.21)	
Male	21 (58.33)	25 (65.79)	
Mother's occupation			0.26 ^b
Housewife	33 (91.67)	32 (84.21)	
Employed	3 (8.33)	6 (15.79)	
Residence			0.06 ^b
City	16 (44.44)	26 (68.42)	
Village	20 (55.56)	12 (31.58)	
Mother's marital status			0.47 ^c
Married	33 (91.67)	37 (97.37)	
Widowed	3 (8.33)	1 (2.63)	
Mother's education			0.13 ^b
Illiterate	16 (44.44)	15 (39.47)	
Primary school to high school	16 (44.44)	10 (26.32)	
High school diploma or higher	4 (11.12)	13 (34.21)	

^aValues are expressed as No. (%).

^bChi-square.

^cFisher's exact test.

is totally out of contact with other people, everybody needs care and support in order to empower herself to return to her normal state after experiencing adverse events. Hence, self-care and communicating with friends and peers could be one of the ways to foster resilience (32). This was accomplished in the present study through the interpersonal strategy of peer education. Thus, the role of peer groups in creating a supportive emotional environment to deal with critical situations is justifiable in improving mothers' resilience. By providing the necessary emotional support within an intimate environment, talking to friends and people with similar conditions can help individuals in situations where they need to be resilient (33).

In the peer education process, people learn to show empathy with other members and express it in relation to the problems raised in training sessions (34). Since empathy could be trained and learned (35), it can be used to improve resilience, especially when a person is facing a life-threatening crisis. Reinforcing skills such as humor, optimism, self-esteem, and enjoying the supportive-emotional system that is achievable in peer groups can be very effective in enhancing resilience among mothers of children with cancer.

The results of this study disclosed that two months after the intervention, a significant difference occurred in

terms of the mean score of personal competence between the control and experimental groups, with the latter acquiring a higher score. Moreover, the score of this subscale changed significantly over time in the experimental group. Some researchers have argued that the activities carried out in peer group meetings enable participants to develop their individual frontiers and edify themselves via introspection, accepting one's own situation, communicating with others, being concerned and responsible with respect to others, and hoping for the future. Nevertheless, these changes require the passage of time (36, 37).

The results also indicated that two months after the intervention, a significant improvement took place in the mean score of trust in one's instincts and tolerance of negative affect in the experimental group when compared to the control group. The score of this subscale showed a significant difference over time in the experimental group, as well. Because sharing knowledge and experience is among the most essential components of peer education programs, it is expected that the formed interactions and familiarity of individuals with people of similar experiences should improve the outcomes for everyone involved (38). Additionally, sharing common experiences can promote empathy in the group. In a sympathetic group, individuals express their psychosocial problems and concerns

Table 3. Comparison of the Mean Total Scores of Resilience and its Subscales Before the Intervention, Immediately After it, and Two Months Later in the Two Groups

Variable/Group	Stage			P Value
	Before Intervention	Immediately After Intervention	Two Months After Intervention	
Total resilience				
Intervention	44.41 ± 18.59	53.94 ± 13.98	80.94 ± 8.60	< 0.001
Control	53.64 ± 21.33	53.75 ± 19.81	56.78 ± 18.63	0.31
P value	0.52	0.94	< 0.001	
Personal competence				
Intervention	14.64 ± 6.64	17.38 ± 5.29	25.33 ± 3.25	< 0.001
Control	17.28 ± 7.19	17.29 ± 7.42	18.15 ± 6.06	0.31
P value	0.12	0.94	< 0.001	
Trust in one's instincts and tolerance of negative affect				
Intervention	10.97 ± 5.28	13.50 ± 4.28	21.02 ± 3.22	< 0.001
Control	13.60 ± 5.87	13.01 ± 6.28	13.60 ± 5.97	0.65
P value	0.13	0.68	< 0.001	
Positive acceptance of change and secure relationships				
Intervention	8.36 ± 4.69	9.97 ± 4.18	16.41 ± 2.19	< 0.001
Control	10.86 ± 5.08	10.95 ± 6.02	11.86 ± 4.47	0.07
P value	0.03	0.41	< 0.001	
Control				
Intervention	4.91 ± 2.89	7.27 ± 1.70	10.61 ± 1.29	< 0.001
Control	6.57 ± 3.42	6.76 ± 3.28	7.86 ± 2.81	0.58
P value	0.02	0.21	< 0.001	
Spiritual influences				
Intervention	5.47 ± 1.46	5.80 ± 1.21	7.55 ± 0.80	< 0.001
Control	5.94 ± 1.64	5.97 ± 1.42	6.07 ± 1.07	0.83
P value	0.19	0.67	< 0.001	

more easily, which can help reduce negative emotions, increase self-efficacy, and achieve inner peace (34, 36). A peer group can also be part of a social support network that is useful to members in various ways, including the provision of informational or emotional support (39, 40). As a result, the improvement of the subscale of trust in one's instincts and tolerance of negative affect is justified.

The findings of the present study also displayed a significant improvement in the mean score of positive acceptance of change and secure relationships in the experimental group when compared to the control group two months after the intervention. Researchers believe that a peer is a valid role model who stimulates significant changes in other people (41). In fact, one of the benefits of a peer group can be to establish an intimate relationship between group members (42). This leads to the formation

of secure ties and a stronger social network and thus, the greater impact of group members on each other.

In comparison to the control group, the mean scores of the two subscales of control and spiritual influences significantly rose in the experimental group two months after the intervention. Membership in a peer group allows individuals to gather in an intimate and mutually understanding environment and improve their support resources. On the one hand, the presentation of useful information in the group gives rise to greater learning and a sense of overcoming obstacles. On the other hand, joining a peer group and observing like-minded people make it easier to accept one's problems and tackle them. As a result, stress decreases and the feeling of being good and having a positive performance boosts (34, 43).

Jung et al. reported that the implementation of a peer

education program augmented the score of the existential and spiritual health of a group of high school girls (44), which is consistent with the findings of the current study.

In the present study, no significant change was observed in the resilience score of the experimental group immediately after the intervention. However, two months post-intervention, this score grew dramatically in the experimental group. Some previous studies aiming at increasing resilience have actually conducted the post-test one week after the intervention (45). Sarkar et al. investigated the effect of health empowerment intervention on teenagers' resilience and performed the post-test three months after the end of the program. The results suggested a significant increase in the resilience score of the subjects at the post-test compared to the pre-test (46). Indeed, some authors argue that resilience is a process that develops gradually with the aid of various factors, including individual interactions (47). Regarding this concept as a process, Galli and Vealey found that the evolution of this process requires the frequent transformation of emotions and/or making unwanted mental struggles through various coping strategies. Therefore, both positive adaptation to the surrounding events and the formation of the concept of resilience are gradual phenomena (48). Hence, it is suggested that the post-test in resilience programs be reinforced by follow-up examinations carried out at different times after the end of the intervention.

5.1. Conclusions

The results of this study exhibited that peer education could improve the resilience of mothers of children with leukemia. In this type of education, people interact with each other, share information, and benefit from the experience of others. Thus, peer education is strongly recommended to healthcare providers as an easy, low-cost, and experience-based therapy that does not require special educational instruments.

5.2. Study Limitations and Suggestions

It is possible that other uncontrolled variables may have affected the level of resilience of participants during the interval between the end of the intervention and the post-test at two months later. It is suggested that future research focuses on the parents or caregivers of children with other types of cancer or chronic illnesses. Besides, future studies can address the impact of peer education on the performance of patients, caregivers, and other groups. Eventually, studies with longer follow-up may yield results different from those of this study.

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Footnotes

Authors' Contribution: Fereshteh Gholijani: Conceptualization and study design. Asadollah Keikhaei: Data analysis. Azam Jamali and Alie Jalalodini: Manuscript composition and editing.

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